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(54) REED VALVE WITH A CURVED PLANE [Kyokumen o yuusuru reed valve]

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[note: Names, addresses, company names, and brand names are translated in the most common manner. Japanese language does not have singular or plural words unless otherwise specified with numeral prefix or general form of plurality suffix. Translator's note]

SPECIFICATION

1. **TITLE OF THE UTILITY MODEL** Reed valve with a curved plane

2. **CLAIMS OF THE UTILITY MODEL**

1. A reed valve comprising a flat reed (vibration piece) and a main body with a curved plane wherein amount of air leak from between said main body and reed is reduced by improving close adhesion with said main body and reed.

3. **DETAILED EXPLANATION OF THIS UTILITY MODEL**

This utility model relates to a reed valve that has a flat reed and main body having a curved plane as its component parts.

As illustrated in the Figure 1, according to the reed valve (this will be hereafter abbreviated as a valve) of conventional type is constructed of a bent reed and flat main body. The purpose of bending said reed is to improve a close adhesion of the reed and the main body to reduce amount of air leakage to improve function as a valve. And therefore, in order to apply a curved plane through work to this reed, a method to draw this with rolls and the like may be considered, however, it has been not only impossible to obtain a uniform curved plane , but also has been costly.

In addition, because said curved plane is very small (for instance, curvature radius being 10 ~ 200 cm), it is difficult to distinguish from a front to a back with naked eyes, and when front and back are attached in a reverse manner, it presents a problem of not serving a function as a valve at all.

This utility model was completed to remove said defect; and this is further explained in reference with attached Figures.

1. It is composed of a flat reed (1) and main body having a curved plane (2) as its main component parts.

2. A reed (1) is placed between a stopper (3) and the main body (2), and when it is fastened with a screw (4) and a nut (5), said reed (1) is pressed strongly along the curved plane of the main body (2) with elasticity, and as a result, gap between the reed (1) and the main body (2) becomes small.

3. The valve assembled in above-explained state allows passing of air from a portion (A) to portion (B); however, air is difficult to pass through in opposite direction, that is to say, from the portion (B) through portion (A).

4. This reed vibrates at vibration rate of 1,000 ~ 10,000 r.p.m. to allow passing and blocking of air. And therefore, when this valve is used as a part of an engine, it allows efficient compression and combustion of mixed gas of gasoline and air within the engine.

Examples of this utility model are explained below.

As explained in this utility model, has a flat reed and curved plane with curvature radius of 40 cm. [note: original document has period after curvature radius, but may be a misprint and this may modify the valve (I) comprising ..... translator's note] the valve (I) that is constructed of the main body, valve (IIa) constructed of a reed processed as a curved plane showing 40 cm curvature radius and flat main body as in the case of ordinary method, and valve (III) that is constructed of the same parts as those of IIa, but front and back of the reed is attached in a reverse manner .....

[note: It is likely that should be read as shown below. translator's note]
The valve (I) that is constructed of a flat reed and main body having a curved plane with curvature radius of 40 cm as explained in this utility model; the valve (IIa) that is constructed of a reed that is worked to show a curved plane with curvature radius of 40 cm and a flat main body as in the case of ordinary method; and the valve (IIb) that is constructed of the same parts as those of IIA, however, front and back of the reed are attached in a reverse manner , and the valve (III) that is constructed of a flat reed and flat main body were manufactured; and results of measuring air leakage immediately after each assembly , and after vibrating reeds continuously at 10,000 r.p.m. vibration rate for 50 hours are shown in the Table 1.

Amount of air leakage was measured by in-water capturing method of air that passes through portion (A) after applying air pressure of 0.2 kg/cm^2 to the portion (B).

Table 1 Air leakage amount cc/m of various valves

	I	IIa	IIb	III
immediately after assembly	213	198	at least 10000	440
after vibration for 50 hours under 10,000 r.p.m.	210	220	at least 10000	1500

As shown in the Table 1, this utility model (I) withstand sufficiently against practical application showing similar amount of air leakage as that of ordinary method (IIa). And therefore, the one (IIb) that is constructed by mistaking front and back of the reed in the ordinary method show a large air leakage and does not function as a valve. In addition, although the valve (III) that is constructed of a flat reed and flat main body may show a small amount of air leakage, it shows large air leakage after vibration for 50 hours under 10,000 r.p.m. to suggest that cannot withstand against long term practical application.

4. BRIEF DESCRIPTION OF THE FIGURES

Figure 1 illustrates an assembly drawing of a valve of ordinary method.

Figure 2 illustrates an assembly drawing of a valve of this utility model.

(1) shows a reed, (2) shows the main body, (3) shows a stopper, (4) shows a screw, and (5) shows a nut.

Figures 1 and 2

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審査請求　未請求

（全　頁）

⑭曲面を有するリードバルブ

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明　　細　　書

1. 考案の名称　　曲面を有するリードバルブ

2. 実用新案登録請求の範囲

1. 平らなリード（振動片）と曲面を有する本体により構成され、本体とリードとの密着性を良くすることにより、本体とリードの間から空気が漏れることを少くしたリードバルブ

3. 考案の詳細な説明

この考案は、平らなリードと、曲面を有する本体を主たる構成部品とするリードバルブに関するものである。

従来方式のリードバルブ（以下バルブと略す）は、第1図に見られる如く、曲げられたリードと平らな本体とにより構成されていた。リードを曲げる目的は、リードと本体の密着性を良くし、空気の漏れ量を少くすることによりバルブの機能を向上させようとするものである。しかるに、このリードに曲面加工を施すには、ロールにて圧延する等の方法が用いられるが、均一な曲面が得られず、また、費用もかかっていた。

また、この曲面は極めて僅か（例えば曲率半径が10～200㎝）であるため肉眼で表裏を判別することは困難であり、表裏を逆に取りつけると、全くバルブとしての機能を果さなくなるなどの問題点があった。

本案は、この欠点を除くために考案されたもので、図によって説明すれば、

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1. 平らなリード①と曲面を有する本体②を主たる構成部品として構成される。
2. ストッパー③と本体②の間にリード①を挟み、ネジ④とナット⑤で締めつけるとき、リード①は、弾性により本体②の曲面に沿って強く押しつけられ、その結果リード①と本体②の間隙は小さくなる。
3. このような状態に組み立てられたバルブは、Ⓐ部分よりⒷ部分へは空気が通過するが、反対の方向つまりⒷ部分よりⒶ部分へは空気が通過し難い。
4. このリードは、1,000～10,000r.p.mの振動数で振動し、空気の通過と遮断を行う。従ってこのバルブをエンジンの部品として使用するとき、エンジン内部のガソリンと空気の混合気体の圧縮・爆発を効率よく行うものである。

本案の実施例を示す。

本案の如く、平らなリードと、曲率半径40cmの曲面を有する本体とより構成されるバルブ(I)、従来方式の如く曲率半径40cmの曲面に加工されたリードと平らな本体とより構成されるバルブ(IIa)、IIaと同じ部品で構成されるが、リードの表裏が逆に取りつけられたもの(IIb)および平らなリードと平らな本体とにより構成されたバルブ(III)を製作し、各々組立直后および10,000r.p.mの振動数で50h連続してリードを振動させた後に空気の漏れ量を測定した結果を第

1表に示す。

空気の漏れ量は、0.2Kg／cm²の空気圧を㊁の部分に加え㊀の部分に通過する空気量を水中捕集法により測定した。

第1表　各種バルブの空気漏れ量 cc／m

	I	IIa	IIb	III
組立直後	213	198	10000以上	440
10,000 r.p.mで50h振動後	210	220	10000以上	1500

第1表に示す如く、本案(I)は、従来方式(IIa)と同程度の空気の漏れ量であり充分実用に耐え得るものである。しかるに、従来方式でリードの表裏を誤って組立てられたもの(IIb)は空気の漏れ量が多くバルブとしての機能を果さない。また、平らなリードと平らな本体より構成されたバルブ(III)は、組立直後に於ては、空気の漏れ量は少いが、10,000 r.p.mで50hの振動後に空気の漏れ量が多くなり、実用上、長期の使用に耐えないものと思われる。

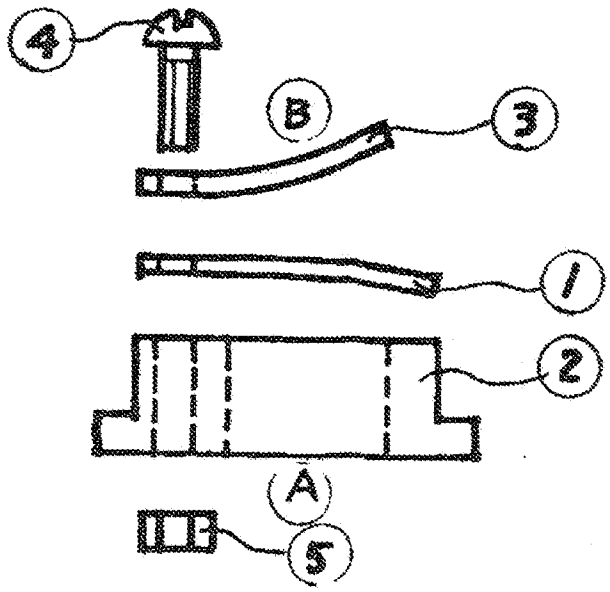
4. 図面の簡単な説明

第1図は従来方式のバルブの組立図である。

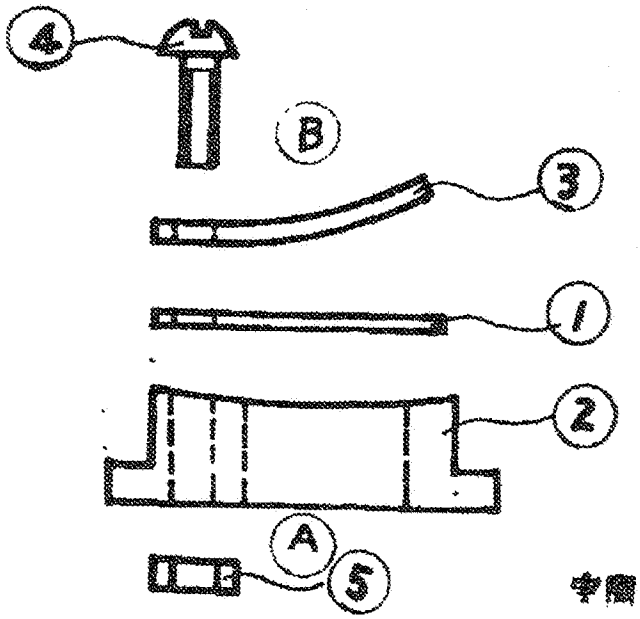
第2図は本案のバルブの組立図である。

①はリード　②は本体　③はストッパー　④はネジ　⑤はナット

第1図



第2図



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